Name: Date:

Polynomial Factoring solution (version 26)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 2x + 25 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(25)}}{2(1)}$$

$$x = \frac{-(-2) \pm \sqrt{4 - 100}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-96}}{2}$$

$$x = \frac{2 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{2 \pm 4\sqrt{6}\, i}{2}$$

$$x = 1 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-3 + 5i$ and $7 + 6i$ in standard form $(a + bi)$.**

Solution

$$(-3 + 5i) \cdot (7 + 6i)$$

$$-21 - 18i + 35i + 30i^2$$

$$-21 - 18i + 35i - 30$$

$$-21 - 30 - 18i + 35i$$

$$-51 + 17i$$

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3. **Write function $f(x) = x^3 - 3x^2 - 18x + 40$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	-3	-18	40
-4		-4	28	-40
	1	-7	10	0

$$f(x) = (x+4)(x^2 - 7x + 10)$$

$$f(x) = (x+4)(x-5)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+6)^2 \cdot (x+2)^2 \cdot (x-1)$$

Sketch a graph of polynomial $y = p(x)$.